

Abstract

A method for calculating the shape of a band-shaped superconductor (3) of a solenoid-shaped coil section of a high-field magnet coil (1) in a transfer region (5) is characterized in that the band-shaped superconductor (3) is changed in the transfer region from a first orientation (3a) tangentially flatly abutting on the surface of a cylindrical coil body (2) and substantially perpendicular to the longitudinal direction of the cylindrical coil body (2) to a second orientation (3b) with its narrow side seating on the surface of the cylindrical coil body and parallel to the longitudinal direction (or vice versa). The path $z(u)$ is determined from the integral-differential equation

$$\frac{z''(u)}{(1+z'(u)^2)^{3/2}} = \frac{\sin(\tau \int_0^u d\hat{u} \sqrt{1+z'(\hat{u})^2})}{r_{\min}}$$

wherein z : axial coordinate; u : azimuthal coordinate; \hat{u} : auxiliary coordinate; τ : constant torsion in the transfer region; r_{\min} minimum bending radius of the band-shaped superconductor, and wherein the position $z=0$, $u=0$ is associated with a boundary point 4a, 4b of the transfer region. This permits conductor guidance of a brittle band-shaped superconductor of a solenoidal coil section in an axial direction in a compact construction without joints.